

Shoichi KAWANO*: Notes on the chromosomes of
Diuranthera major Hemsl. (Liliaceae-Asphodeleae)

河野昭一*: *Diuranthera major* Hemsl. の染色体について
(Pl. III—IV)

The genus *Diuranthera*, which is, according to Hutchinson (1959), referred to the Liliaceae-Asphodeleae, is known to comprise two species: i. e., *D. major* Hemsl. and *D. minor* C. H. Wright, both native to Western China (Hooker, 1905). A good illustration and description of *D. major* is given in Hooker's *Icones Plantarum*, t. 2734 (Hooker, l. c.). The taxonomic status of another species, *D. minor* C. H. Wright, is, however, not well established yet and further studies are needed (c.f. Hooker, l. c.).

By the courtesy of Dr. T. Yamazaki, the present author had an opportunity to examine the chromosomes of *D. major*. The living plants of *D. major* were raised from the seeds obtained through the Kunming Botanical Garden from Yunnan, China. The plants raised attain about 40-60 cm in height, scapes of which are glabrous and characterized by having pale creamy-white flowers, perianths being linear-lanceolate and strongly recurved. The stamens are also very characteristic, having yellow, elongate and recurvate anthers which are bicaudate at the base (Fig. 1). Leaves are somewhat crispate-undulating, soft and minutely papillose at the margin. These characters of the plants examined match very well with the description provided by Hooker (l. c.).

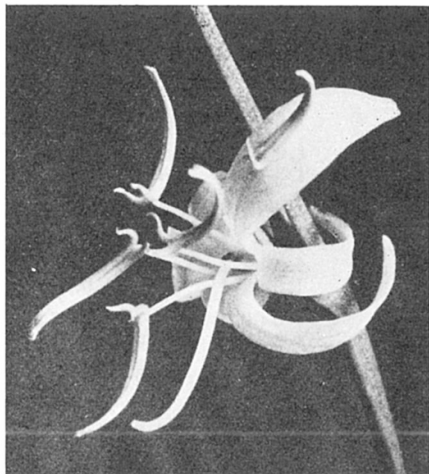


Fig. 1. The flower of *Diuranthera major* Hemsl. (Photo by Mrs. T. Yamazaki)

The cytological preparations were made using a modification of the oxy-quinoline-aceto-orcein squash method (Kawano, 1965). Voucher specimens are preserved in TI.

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Tab. 1. Somatic chromosomes of *Diuranthera major* Hemsl. (cf. Pl. IV).

Chromo- somes	Length of arm in μ	Total in μ	Index	Chromo- somes	Length of arm in μ	Total in μ	Index
1.	2.7+6.3	9.0	0.43	15.	1.0+2.2	3.2	0.45
	2.7+6.3	9.0	0.43		1.0+2.2	3.2	0.45
2.	2.7+6.3	9.0	0.43	16.	1.0+2.2	3.2	0.45
	2.2+6.3	8.5	0.35		1.0+2.5	3.5	0.40
3.	2.0+6.8	8.8	0.29	17.	1.0+2.2	3.2	0.45
	2.2+6.8	9.0	0.32		1.0+2.2	3.2	0.45
4.	1.3+7.2	8.5	0.18	18.	1.0+2.2	3.2	0.45
	1.5+6.8	8.3	0.22		1.0+2.2	3.2	0.45
5.	1.5+5.5	7.0	0.27	19.	1.0+2.2	3.2	0.45
	1.5+5.2	6.7	0.29		1.0+2.2	3.2	0.45
6.	1.8+4.5	6.3	0.40	20.	1.0+2.2	3.2	0.45
	1.8+5.0	5.8	0.36		1.0+2.2	3.2	0.45
7.	1.3+4.5	5.8	0.29	21.	0.8+2.2	3.0	0.36
	1.5+4.5	6.0	0.33		0.8+2.0	2.8	0.40
8.	1.3+4.3	5.6	0.30	22.	0.8+2.0	2.8	0.40
	1.5+4.0	5.5	0.38		0.8+2.0	2.8	0.40
9.	1.0+3.0	4.0	0.33	23.	2.0+2.2	4.2	0.91
	1.3+3.2	4.5	0.40		2.0+2.2	4.2	0.91
10.	1.3+3.0	4.3	0.43	24.	1.8+2.0	3.8	0.90
	1.3+3.0	4.3	0.43		1.8+2.2	4.0	0.82
11.	1.5+2.7	4.2	0.56	25.	1.5+1.8	3.3	0.83
	1.5+2.7	4.2	0.56		1.3+2.0	3.3	0.65
12.	1.0+2.7	3.7	0.37	26.	1.5+1.5	3.0	1.00
	1.3+2.7	4.0	0.48		1.5+1.8	3.3	0.83
13.	1.0+2.5	3.5	0.40	27.	1.5+1.8	3.3	0.83
	1.3+2.5	3.8	0.52		1.5+1.5	3.0	1.00
14.	1.3+2.5	3.8	0.52	28.	1.3+1.5	2.8	0.87
	1.3+2.2	3.5	0.59		1.3+1.3	2.6	1.00

Material examined in the present investigation proved to possess $2n=56$ chromosomes, the number firstly established for the genus (Pl. III-A). The chromosome complement consists of 22 pairs of J-shaped chromosomes with a subterminal constriction (Pl. IV, Nos. 1-22), of which four pairs are large, ranging 8.3-9.0 μ in length (Nos. 1-4), four pairs medium (Nos. 5-8), ranging 5.5-7.0 μ long, and the remaining 14 pairs (Nos. 9-22) small (the size range: 2.8-4.5 μ). Among them especially, the two pairs, Nos. 21 and 22, are small and may be distinguished from the rest (cf. Pl. IV). Although there is some size

variation in these 14 pairs, it is rather difficult to make clear demarcations between them and classify them into certain groups as their variations are continuous. Of the 28 pairs in the chromosome complement, the remaining six pairs (Nos. 23-28) are small and metacentric, two pairs (Nos. 23 and 24) of which are, however, somewhat larger and discernible from the remaining four pairs (Nos. 25, 26, 27 and 28).

Though the data available at present are limited, the karyotype formula of this species may roughly be expressed as follows:

$$K(2n)=56=8J+8j_1+24j_2+4j_3+4m_1+8m_2$$

It is known at present that several genera referred to the Asphodeleae (Hutchinson, l. c.) have the basic number of $x=7$; for example, *Asphodeline*, *Asphodelus*, *Bulbinella*, *Eremus*, etc. (Darlington and Wylie, 1955). Therefore, it may possibly be considered that the genus *Diuranthera* here under consideration as well to have the same basic number as given above, i. e., $x=7$. However, many other genera belonging to the Asphodeleae show different basic numbers, e. g., $x=8$ in *Echeandia*, *Simethis*, etc., $x=9$ in *Chlorogallum*, $x=10$ in *Alectorrurus*, and $x=11$ in *Chamaescilla*, *Arthropodium*, *Dichopogon*, *Anemarrhena*, etc. (cf. Darlington and Wylie, l. c.). This fact suggests that the Liliaceae-Asphodeleae may contain some very heterogeneous groups in it.

Also, attention should here be paid to the fact that the resting nuclei of *D. major* clearly reveal fusion of the chromocentres into large and numerous heteropycnotic bodies (Pl. III-B & C). It is a well founded fact that the presence of the interphase chromocentres is associated with the differential or H-segments visible under the cold treatment (Darlington and La Cour, 1938, 1940; Dyer, 1963). Kurabayashi and his collaborators (Kurabayashi, 1952, 1958) have made use of these facts in their population studies on *Trillium kamtschaticum*. In this connection, detailed future studies with the *Diuranthera* plants may unravel some interesting evolutionary problems.

The author wishes to thank Dr. and Mrs. T. Yamazaki for their kindness of giving a chance to study this interesting plant cytologically.

References

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中国雲南産ユリ科の一種 *Diuranthera major* Hemsl. の染色体について調べた。体細胞で $2n=56$ であることがわかった。核型式は $K(2n)=56=8J+8j_1+24j_2+4j_3+4m_1+8m_2$ で表わされる。Hutchinson (1959) によるとこの属は *Asphodeleae* 族に属するが、この族の植物には基本数が $x=7, 8, 9, 10, 11$ などのものが知られており、さらにくわしい外部形態との比較研究が望まれる。

Explanation of plates III and IV

Pl. III. A: Somatic chromosomes of *Diuranthera major* Hemsl. $2n=56$. B & C: Heteropycnotic bodies visible in the interphase nuclei. Typical resting nuclei showing fusion of chromocentres into 10-14 heteropycnotic bodies.

Pl. IV. Somatic chromosome complement of *D. major* Hemsl. $2n=56$.

○キミノクロガネモチ (植木秀幹・得居 修) Homiki UYEKI & Osamu TOKUI: *Ilex rotunda* f. *xanthocarpa*

松山市南斎院町 883 医師 渡部康民氏の庭に、かなり大きなクロガネモチの黄果品があり、1953 年に採集し、そのままになっていたが、このたび下記の名称を与えることにした。この木は、昭和 6~7 年頃、市内の植木業者から買ったらしい。現在の成育状態はすこぶる良好で、庭木として果実もよくつき、クロガネモチよりも一段と美しい。

(愛媛県大洲市柚木・同県北条市神田)

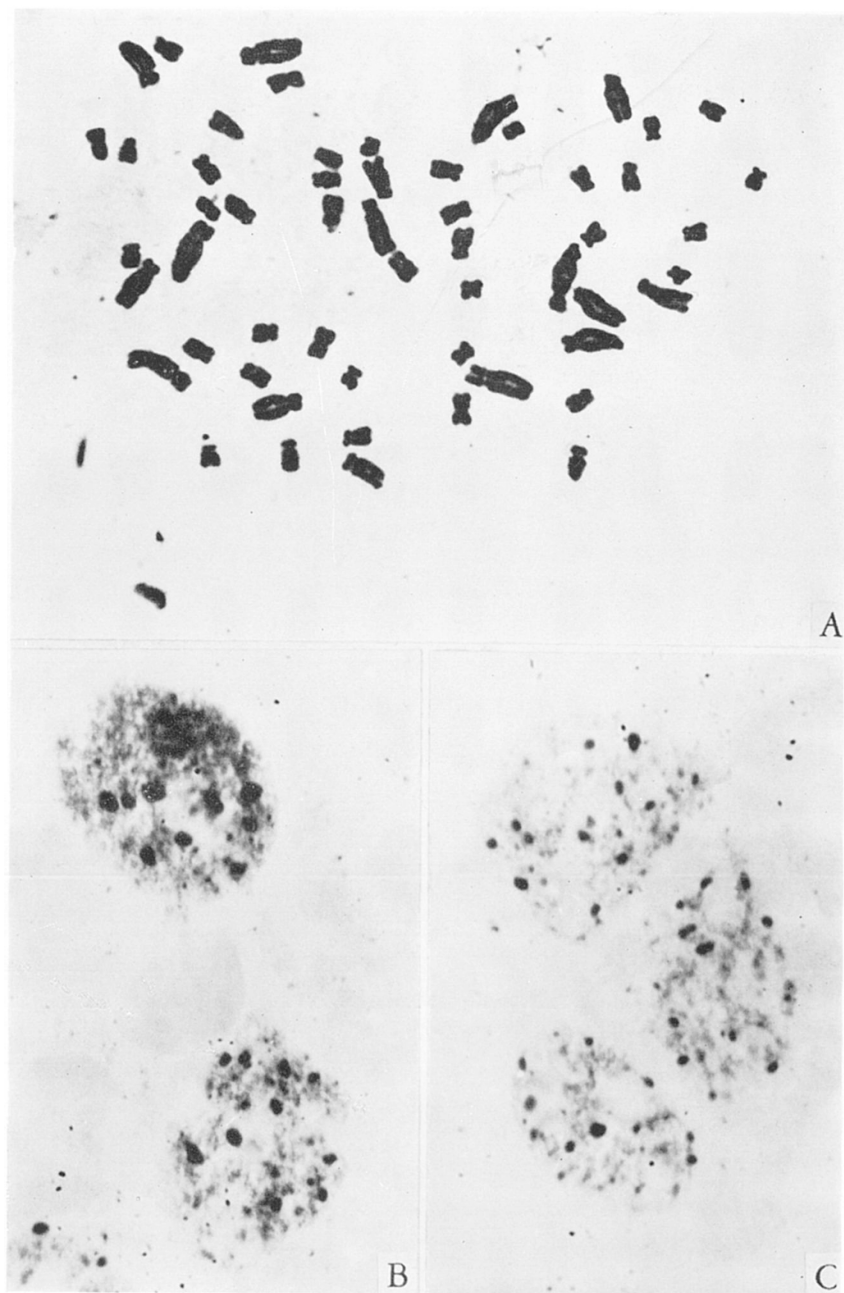
Ilex rotunda Thunberg forma **xanthocarpa** Uyeki et Tokui form. nov.

Rami hornotini flavescentes. Folia viridescentia sed non viridissima, petiolis flavescentibus. Fructus flavi. Cetera ut in typo.

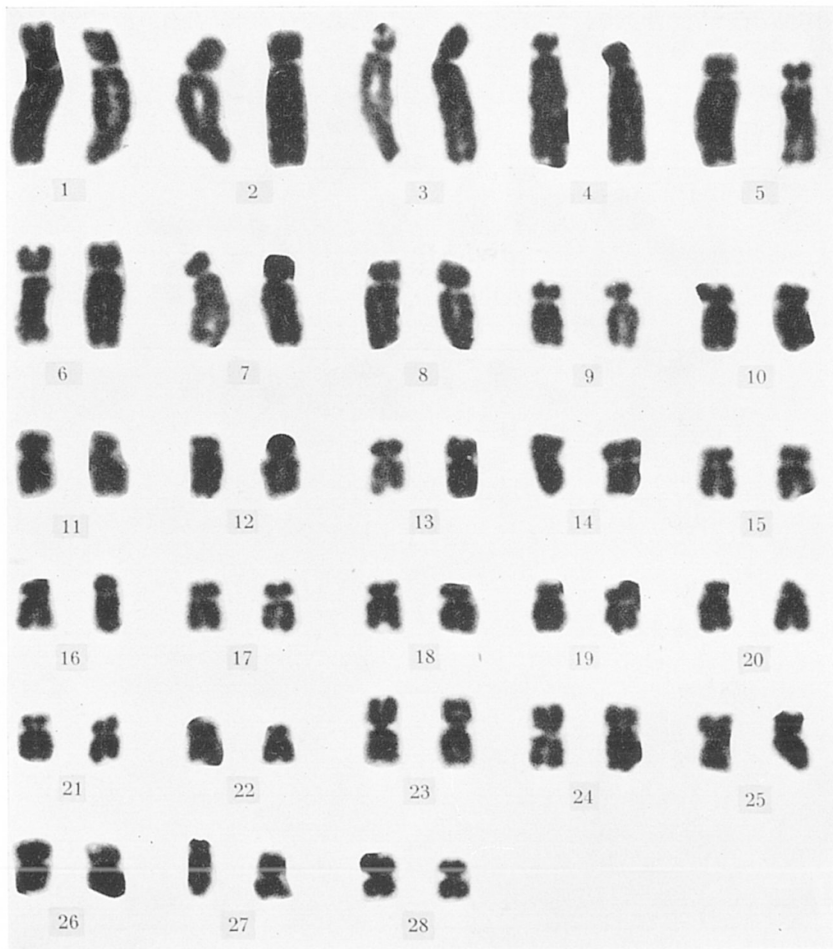
Nom. jap. Kimino-kuroganemoti

Hab. Cult. in horto Watanabei, oppido Minamisaya-mati, Matuyama, prov. Iyo (O. Tokui. Jan. 1953)

This tree is 7 m in the height and 20 cm in the diameter at breast height, perhaps over 60 years, and growing in the healthy condition.



S. KAWANO: Chromosomes of *Diuranthera major*

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